Fall 9-1-2021

M 122.02: College Trigonometry

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M 122 – College Trigonometry – Fall 2021

Basic Information

- Masks are required in the classroom.
- Covid vaccine is strongly advised. We are not implementing social distance protocols. We will take attendance and use seating charts for contact tracing.
- If you feel sick and/or are exhibiting COVID-19 symptoms, please do not come to class; contact the Curry Health Center at (406) 243-4330. Also contact your instructor for alternative ways of receiving and submitting course materials if you are in quarantine or isolation.

Section	CRN	Meeting Times: MWF	Room
2	71257	1 – 1:50 PM	MATH 103

Instructor: **Regina Souza**
Email: regina.souza@umontana.edu
Office Phone: 406-243-2166 (for leaving voicemail messages; email is preferred)
Appointments: You can email me, leave a voice message, or use the booking calendar on my webpage.

Course Catalog Description

Offered autumn and spring. Prereq., M 121 or ALEKS placement >= 4. Preparation for calculus based on college algebra. Review of functions and their inverses. Trigonometric functions and identities, polar coordinates and an optional topic such as complex numbers, vectors or parametric equations. Credit not allowed for both M 122 and M 151. Credit hours: 3

Learning Outcomes

Upon completion of this course, students will be able to:

- Demonstrate conceptual understanding of trigonometry and solve problems using four different points of view: geometric (graphs, pictures), numeric (evaluation, tables), symbolic (formulas, identities), and written (verbal descriptions and interpretations).
- Be flexible and have the ability to choose between these points of view when solving problems such as computing the values of special angles in degrees or radians; using, proving or disproving trigonometric identities; finding domain and range, intercepts, symmetries, periodic behavior, and asymptotes.
- Use similarity of triangles and symmetries of the circle to compute trigonometric ratios and to obtain basic relationships between them.
- Choose between the Pythagorean theorem, law of sines or law of cosines when solving right or oblique triangles.
- Create graphs when given a formula of a trigonometric function; write a formula when given a graph of a sinusoidal function. Convert between Polar and Cartesian coordinates, plot points and graph polar equations.
- Build new functions from existing ones: using transformations, composition, and the algebra of functions. Identify when a function has an inverse. Identify domain and range and graph the inverses of sine, cosine and tangent. Use them to solve trigonometric equations.

- Describe real world situations using trigonometric functions, and interpret functions and their parameters in real word contexts.

General Education Learning Outcomes

Upon completion of the mathematical literacy requirement, a student will be able to apply effectively mathematical or statistical reasoning to a variety of applied or theoretical problems.

Required Textbook

Chapters 5-8 of *Precalculus: An Investigation of Functions (Edition 2.1)* by David Lippman and Melonie Rasmussen (free to download). You can download it from the website directly or from a folder to Moodle. **If you prefer a bound printed copy, order it as soon as possible.**

Course Content

1. Similarity of Triangles, Circles, Angles, Right Triangle Trigonometry ; Applications
2. Trigonometric Functions; Graphs; Modeling with sinusoidal functions
3. Trigonometric Identities and Equations, Inverse Trigonometric Functions
4. Law of Sines and Law of Cosines; Polar Coordinates; Parametric Equations for Circles

Policies for Quizzes, Tests, and the Final

There will be a separate document, available on Moodle under "Course Information". It will describe the policies for remote exams if the situation changes and we need them.

Calculators

Calculators can be a useful tool for mathematics, making computations less tedious and aiding in exploration of sound mathematical intuition. However, we must be careful. Relying too heavily on calculators can hinder the development of reasoning, estimation, and mental mathematics skills. Plus, it's important to be able to trust your own brain's computational power. Calculators can make mistakes too, and you will never find these mistakes unless you can do enough math in your head to say "That doesn't look right …" For these reasons, **calculators will *not* be allowed on in-class exams**. In class, projects, possibly take-home assessments, and on homework, we will make computations and graphs with Desmos and WolframAlpha. Geogebra is also a good tool (apps can be downloaded and used offline).

Course Calendar

Dates	**Topic**
September 8 (5 pm)	Last day students can add a course on CyberBear
September 20 (5 pm)	Last day to drop a course on CyberBear or change grading option to audit
September 24	**Test 1**
October 29	**Test 2**
November 1 (5 pm)	Last day to add/drop course by paper w/o Dean's approval.
December 3	**Test 3**
December 10 (5 pm)	Last class day, and last day to petition to drop/add and change to CR/NCR
Dec. 15 (1:10-3:10pm)	**Cumulative final exam**

Grading Policy

Item	Percentage of Course Grade
Reading Quizzes (Moodle)	10%
WeBWorK (online homework)	15% (10% problem sets; 5% review for tests)
Quizzes	10%
Projects	10%
Participation	5% (Some additional Moodle Assignments)
Three midterm exams	30% (10% each)
Cumulative final exam	20%
Showing progress at the end / flexibility	The scaled score of the final exam can replace any of the other 10% items when computing the course final grade.

Grade Scale

Cutoff Percentage:	93%	90%	87%	83%	80%	75%	70%	65%	62%	58%	55%
Grade:	A	A-	B+	B	B-	C+	C	C-	D+	D	D-

Some strategies to complete this course successfully

Check you have the prerequisites

You need an Aleks placement level 4, M02 $\geq$ 14, consent of instructor, or completion of M 100.

Check this course is relevant to your educational goals

Take this course because you are interested in learning the material, because you have a purpose. It is hard to stay motivated otherwise.

Prepare (Read the Textbook and Complete the Reading Quizzes)

Before a new topic is introduced, you will be asked to read the section and to work on a Moodle quiz. The intended learning outcome is to increase your skills of retrieving mathematical information from a textbook, and to learn to assess how much you understand. The last quiz question will be a request for feedback, opening up the lines of communication between each individual student and the instructor.

Practice Together (Attend Classes and Engage in the Learning Activities)

Showing up regularly to class is the key to successfully completing this course. You will be given a chance to practice with your instructor and classmates right there with you. Attendance will not be part of the grade; we will check face-to-face attendance for contact tracing.

Daily Individual Practice (Complete the WebWorK Assignments)

One of the best ways to learn mathematics is to do mathematics. Regular online homework assignments (on WeBWorK) are due Monday, Wednesday and Friday at 11:59 PM and the day before a test, at 8 PM. Please complete each assignment to the best of your ability 24 hours prior the deadline so you can identify any issues you would like to be discussed (in class, via email, in the Math Learning Center, or maybe with a classmate) before the homework closes. Expect at least 2 hours of work outside class every day.

Integration (Complete the Projects, Practice Tests and Review Assignments)

After we understand something piece by piece, it is time to construct an overview picture. The projects are designed to apply what you learned; using mathematical models (functions) to enrich your understanding of a particular case scenario. The requirement is to approach it from multiple points of view: conceptually

(verbally), graphically, numerically (tables), symbolically (formulas) and report (without any mathematical lingo) on what new information you have uncovered. The practice tests and review assignments will require you to choose a strategy for a particular problem (a skill quite different from the one required when you are doing your daily homework, where most of the time the skill required maybe in the previous page of the textbook, or is similar to something was discussed in class). These activities are best if started individually, and then discussed with others.

Get Support and Stay in Contact with your Instructor and Classmates

Form study groups, take advantage of the Math Learning Center, contact your instructor. To me, this is the main difference between learning from taking a class and learning from searching information on the Web or in a textbook. Please let us know if something happens and you need to be absent (especially if you would miss an assignment).

Assessments (Quizzes, Midterm Exams and Final Exam)

Reading Quizzes

Due usually Sunday, Tuesday and Thursday on Moodle (the day before a new topic starts)

Quizzes

Weekly, mostly Fridays, taking about 10-20 minutes in class.

Projects

Total of 4 projects during the semester (see schedule overview)

Midterm Exams

There will be three 50-minute in-class exams during the semester. If you have a legitimate schedule conflict with an exam, please let me know as early as possible.

Final Exam

The final exam will be held on Tuesday, April 27 from 3:20 to 5:20 PM. This time is listed in the official final schedule for the course. By enrolling in this course, it is understood that you will be present for the final exam; let us know if you have a conflict. The final exam is worth 20% of your final grade (30% if you choose to take advantage of the flexibility policy).

Course Guidelines and Policies

No recordings of class meetings are planned at this time

Please DO NOT come to class if you are experiencing Covid symptoms. Let your instructor know as soon as possible. We will work out an individual plan for you to learn while in quarantine.

Classroom and Course-related Behavior

University policy requires that all of us in the classroom treat each other with respect, and refrain from behavior that will disrupt the educational process. Please refrain from using any electronics during class that are not directly related to what we are doing. If you would prefer to be called by a **different name, or gender pronoun**, than listed on the course roster, please let your instructor and classmates know.

Student Conduct Code

All students need to be familiar with the Student Conduct Code. You can find it in the "A to Z" index on the UM home page. In particular, discrimination and harassment are not tolerated at the University of Montana. If you feel that you have been subjected to discriminatory or harassing behavior, please contact the Office of

Equal Opportunity and Title IX at 243-5710 or read UM's Policy on Discrimination, Harassment, Sexual Misconduct, Stalking, and Retaliation for help in addressing the situation. You can also report the discrimination or harassment to me or to another faculty member or advisor you trust.

Academic Honesty

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

Disability Modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

Statement on Digital Access

Digital devices (like laptops and cell phones) are becoming increasingly important to success in college. In this course, you may need digital devices to access readings, complete and submit written assignments, complete online quizzes, verify your attendance, take in-class polls, and more. I recognize that some students are unable to afford the cost of purchasing digital devices and that other students rely on older, more problem-prone devices that frequently break down or become unusable. I also recognize that those technology problems can be a significant source of stress for students. Given those challenges, I encourage students to contact me if they experience a technology-related problem that interferes with their work in this course. This will enable me to assist students in accessing support.

Due Dates and Late Work

Extensions for Reading Quizzes and Webwork Assignments: If you cannot meet a deadline for a good reason, contact your instructor before the due date has passed, and we will usually be able to give you an extension. (If this policy is abused and we receive too many extension requests, we might have to change this policy and only grant extensions in cases of documented illness or other exceptional circumstances beyond your control.)

Except in exceptional circumstances, quizzes/exams must be taken at their scheduled time. If you know you have a conflict with a quiz/exam, please contact me or your instructor **early** to see what arrangements can be made.